

Borehole

20-00-09

Log Event A

Borehole Information

Farm : <u>B</u>	Tank : <u>B</u>	Site Number : <u>299-E33-57</u>
N-Coord : <u>45,300</u>	W-Coord : <u>52,928</u>	TOC Elevation : <u>654.86</u>
Water Level, ft :	Date Drilled : <u>12/31/1944</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.365</u>	ID, in. : <u>10</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>150</u>	
Type : <u>Steel-welded</u>	Thickness, in. : <u>0.406</u>	ID, in. : <u>12</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>50</u>	

Cement Bottom, ft. : <u>150</u>	Cement Top, ft. : <u>149</u>
---------------------------------	------------------------------

Borehole Notes:

Borehole 20-00-09 was drilled in December 1944 to a total depth of 150 ft. Data from the drilling log and Chamness and Merz (1993) were used to provide borehole construction information. The borehole was initiated with 12-in. casing, which was driven to a depth of 50 ft. A 10-in. casing was installed inside the 12-in. casing and driven to a depth of 150 ft. The drilling log reports that the 10-in. casing was perforated from 49 to 149 ft and that the bottom of the 10-in. casing was sealed with half a sack of cement. The thicknesses of the 12-in. and 10-in. casings are presumed to be 0.406 in. and 0.365 in., respectively, on the basis of the published thickness for schedule-40, 12-in. and 10-in. steel tubing.

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency : <u>35.0 %</u>
Calibration Date : <u>04/1997</u>	Calibration Reference : <u>GJO-HAN-14</u>	Logging Procedure : <u>P-GJPO-1783</u>

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>09/03/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>122.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>68.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>09/05/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>32.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Borehole

20-00-09**Log Event A**

Log Run Number :	<u>3</u>	Log Run Date :	<u>09/08/1997</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>69.0</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>31.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Logging Operation Notes:

This borehole was logged in three log runs. The top of the borehole casing, which is the zero reference for the SGLS, is approximately even with the ground surface. The total logging depth achieved by the SGLS was 122.0 ft.

Analysis Information

Analyst : E. LarsenData Processing Reference : MAC-VZCP 1.7.9Analysis Date : 02/02/1999**Analysis Notes :**

The pre-survey and post-survey field verification for each logging run met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the accepted calibration spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

This borehole is double-cased with 10-in.- and 12-in.-diameter casings from the ground surface to 50 ft and single cased with 10-in.-diameter casing from 50 ft to total depth. A casing correction factor for a 0.650-in.-thick steel casing was applied to the concentration data collected from the ground surface to 50 ft because it most closely matches the 0.771-in. total combined thickness of the double casing. A casing correction factor for a 0.365-in.-thick steel casing was applied to the concentration data collected from 50 ft to the bottom of the borehole.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Results/Interpretations:

The man-made radionuclide Cs-137 was detected around this borehole. The Cs-137 contamination was measured continuously from the ground surface to 4 ft and nearly continuously from 101.5 ft to the bottom of the logged interval (122 ft). Isolated occurrences and a few small zones of Cs-137 contamination were



Spectral Gamma-Ray Borehole
Log Data Report

Page 3 of 3

Borehole

20-00-09

Log Event A

detected between 5.5 and 99.5 ft.

The K-40 concentrations increase slightly from 31 to 34.5 ft. The KUT concentrations increase at 49.5 ft, where the casing thickness changes.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank B-111.